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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the Application of:	:	
Andrea F. Gulla, et al.	:	Group: 1793
Serial No.: 10/830,182	:	
Filed: April 22, 2004	:	Examiner: Hailey, Patricia L.
For: CATALYST ... REDUCTION	:	

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November 4, 2008

REPLY BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Responsive to the Examiner's answer of September 9, 2008, Applicants are filing the present Reply brief.

With respect to the Examiner's rejection of claims 1, 3, 5 to 7, 10, 12, 13, 15 to 19 and 46 to 48 under 35 USC 103 as being obvious over Forquy et al in view of Lang et al and Ito et al, Applicants have repeatedly directed the Examiner's attention to the fact that Forquy et al disclose catalysts for heterogeneous chemical reaction, in particular for the manufacture of thiophene, which is a technical field totally unrelated to electrocatalysts for oxygen reduction. One of the essential features of electrocatalysts is their electrical

conductivity, as it is well known to anyone of skill in the relevant art. In Forquy et al, only non-conductive catalyst supports, including "active carbon", are mentioned. The Examiner's assumption that "the catalyst of Forquy et al would be expected by one of ordinary skill in the art to function as an electrocatalyst for oxygen reduction, absent the showing of convincing evidence of the contrary", is devoid of any factual basis. On the other hand, Prof. Faita's declaration, which the Examiner refused to consider, is a convincing evidence that one skilled in the art would expect "active carbon" to read on a prima facie non-conductive item and the catalyst of Forquy et al. to be obviously ineffective for any electrochemical use, including oxygen electroreduction.

Lang et al is also directed to catalysts for heterogeneous chemical reactions, which again is a technical field totally unrelated to electrocatalysis.

Firstly, Applicants fail to understand why one skill in the art should combine the teachings of documents pertaining to an unrelated field to design a catalyst for oxygen electroreduction, especially when the two cited documents make no mention at all of electrocatalysis, of oxygen reduction or of electrical conductivity. On column 4 line 59 and ff. For example it is specified how "the catalyst compositions of Lang et al's invention may be used to convert any **non-gaseous carbonaceous** material", while the scope of the present invention is a catalyst to electrochemically convert a gaseous, non-carbonaceous species".

Secondly, the presently claimed subject matter should in the worst of cases be regarded as a purposive selection over Lang et al, which discloses cobalt and ruthenium among a list of elements covering half of the Periodic Table of Elements, and which mentions carbon black within a list of every known carbonaceous supports (including soot!), without providing a specific example of the preferred use of any of the two. Ito et al is not directed to sulfide species, therefore it is not clear why one skilled in the art should rely on Ito's teaching to modify the teaching of another document pertaining to a different technical field.

The technical problem addressed and solved by the present invention, which is to provide an electrocatalyst for oxygen reduction showing a good chemical stability in a hydrochloric environment in the presence of dissolved chlorine and optionally of dissolved oxygen was not addressed in any of the above documents; considering the fact that novelty of the challenged claims was not disputed, this is an unmistakable indication that the above claims are also inventive.

Applicants wish to point out that the Examiner is compelled to consider Prof. Faita's declaration after the filing of an RCE which restarts the prosecution again. There is absolutely no support for the Examiner's assertion that the RCE "did not necessitate consideration of the declaration". The declaration clearly states that active carbon is not carbon black that the claims require a conductive carbon black and that active carbon has negligible conductivity so Forquy et al clearly has nothing to do with Applicants' invention and does not anticipate or render obvious the invention.

The declaration clearly shows the patentable contribution since Forquy et al does not have conductive carbon black and shows the difference from active carbon. Moreover, Example 4 of the application compares the catalyst of Example 1 to 3 with comparative catalyst and the results on page 13 show that the catalyst of the invention showed only small traces of ruthenium lost while the comparative catalyst showed extensive ruthenium leaching has occurred.

Example 6 of the application shows that the catalyst of the invention showed an acceptable catalytic activity resulting in a modest or negligible voltage increase as compared to the state of the art catalyst 0. Therefore, the record clearly shows the patentable distinction of the invention.

With respect to the rejection of claims 20 to 22 and 36 to 40 under 35 USC 193 based on Reeve et al taken in view of Forquy et al, Lang et al and Ito et al, Reeve et al teaches carbon-supported transition metal sulfide electrocatalyst which do not include a ruthenium and cobalt sulfide. The Examiner's assumption that the disclosure of Forquy et al renders the replacement of Mo with Co obvious is moot, since the fact that these two elements are allegedly equivalent when used in a catalyst for heterogeneous chemical reactions doesn't give any information at all about their possible equivalence as electrocatalysts for oxygen reduction. Moreover, none of the cited documents addresses or solves the technical problem of providing an electrocatalyst for oxygen reduction showing a good chemical stability in a hydrochloric environment in the presence of dissolved chlorine and optionally of dissolved oxygen. Moreover, the combination of

Reeve et al does not overcome the deficiencies of the secondary art as discussed above and therefore this rejection fails.

With respect to the rejection of claims 1, 3, 5 to 7, 12, 14 to 19, 47 and 48 as being obvious over Kobylinski et al taken in view of Forquy et al, the Examiner's arguments are groundless since they are based on the fact that instantly claimed "carbon black" is equivalent to "refractory oxide or activated carbon". One of skill on the art would know that this is not the case, so that Kobylinski et al does not provide any useful indication to derive the present invention. Again, Kobylinski et al is directed to a totally unrelated field of application, and does not anticipate nor renders obvious the electrocatalyst for oxygen reduction of the present invention. Neither Kobylinski et al nor Forquy et al pertain to the same technical field of the present invention, none of the two mention any material useful for electrocatalysis or oxygen reduction, and obviously none of the two provides a clue for solving the technical problem of providing an electrocatalyst for oxygen reduction showing a good chemical stability in a hydrochloric environment in the presence of dissolved chlorine and optionally of dissolved oxygen. Therefore, this ground of rejection also fails.

From the above remarks, it should be clear that the rejections which are based on Forquy et al clearly does not teach Applicants' patentable features and the advantages

thereof, so the Board of Patent Appeals and Interferences should reverse the Examiner's rejections.

Respectfully submitted,

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CAM:mlp
Enclosures